

Abstract

Valve guide and spring retainer assemblies are described for use in plunger pump housings that incorporate structural features for stress-relief. These pump housing structural features accommodate correspondingly-shaped valve guides and/or spring retainers that are internally fixed in place using one or more non-threaded spacers. Plunger pumps so constructed are relatively resistant to fatigue failure because of stress reductions, and they may incorporate a variety of valve styles, including top and lower stem-guided valves and crow-foot-guided valves, in easily-maintained configurations. Besides securing valve guides and/or spring retainers, non-threaded spacers may be shaped and dimensioned to aid in further reducing stress and to improve volumetric efficiency of the pumps in which they are used.